SmallSat Common Electronics Board (SCEB)

Completed Technology Project (2014 - 2018)

Project Introduction

We propose to design a low-power general-purpose SmallSat Common Electronics Board (SCEB). The SCEB design will be based on input received from a group of hand-picked engineer advisors across multiple discipline areas. We also propose to investigate methods of implementing power saving techniques in the design.

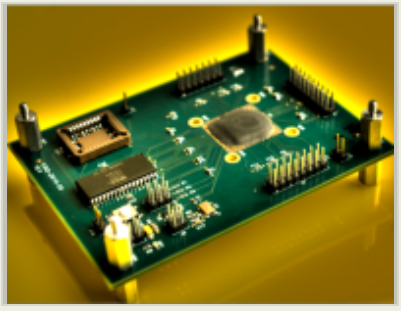
The objective of this FY15 effort will be to design a tightly integrated SmallSat electronics board that leverages prior investment and lessons learned. Activities that will be completed include the following:

- Complete multiple trade studies to determine how to design all of the proposed SCEB functionality
- Generate a set of requirements and a design specification for the SCEB design.
- Complete a board schematic
- Layout the SCEB design

GSFC places a priority and urgency on the development of tightly-integrated electronics solutions for a vast array of science instruments. Given that the current fiscal environment favors the development of spacecraft with low cost, mass, and power consumption that can deliver vital science data from space, this proposal will directly impact GSFC by creating a new and unique design capability that is modular, flexible, and miniaturized. This will aid in greatly reducing cost and increasing schedule efficiency across all phases of future missions. As a result of these factors, multiple SCEB units can be built up and used on board satellite constellation missions or a single SCEB can be custom built and assembled to fit the needs of the mission.

Anticipated Benefits

Goddard Space Flight Center is in the process of planning new missions that will require the design of flight hardware that is in a smaller form factor and more cost efficient than what has been developed on past missions. The SCEB is the first step towards developing flight hardware in house at Goddard that can be used for future planned missions.



Electronics Board

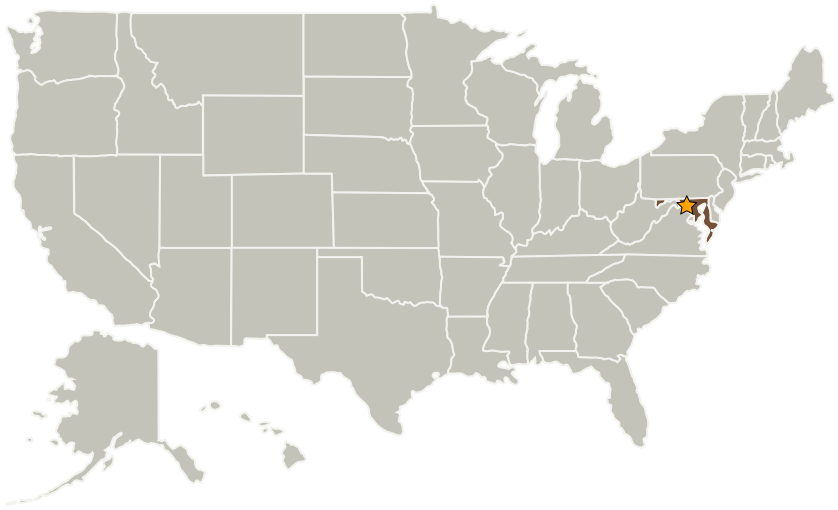
Table of Contents

Center Independent Research & Development: GSFC IRAD

SmallSat Common Electronics Board (SCEB)

Completed Technology Project (2014 - 2018)

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations
Maryland

Project Transitions

October 2014: Project Start

Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Center Independent Research & Development: GSFC IRAD

Project Management

Program Manager:

Peter M Hughes

Project Managers:

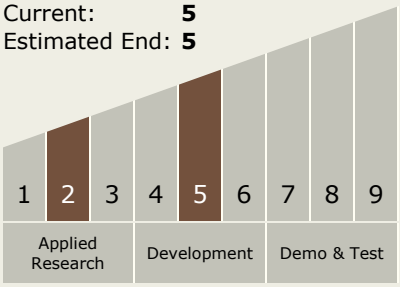
Wesley A Powell
Daniel A Mullinix

Principal Investigator:

James E Fraction

Technology Maturity (TRL)

Start: **2**
Current: **5**
Estimated End: **5**



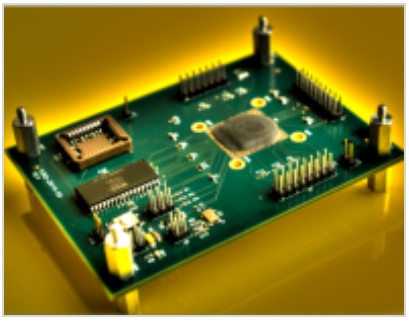
SmallSat Common Electronics Board (SCEB)

Completed Technology Project (2014 - 2018)

September 2018: Closed out

Closeout Summary: The SCEB architecture definition was completed including documenting the architecture definition and requirements derived from the archi tecture on subsystems/components. Subsequently, generated the preliminary d esign based on architecture work, maximizing GMSA reuse. Deliverables include block diagrams and identification of critical items. The selected board componen ts were procured. Initially, the board design, layout, and bare board fabrication were planned to be completed for a few board designs in FY18. These activities have been deferred until FY19 and were undertaken by a new Principle Investiga tor. The purpose of the Goddard Space Flight Center's Internal Research and De velopment (IRAD) program is to support new technology development and to ad dress scientific challenges. Each year, Principal Investigators (PIs) submit IRAD proposals and compete for funding for their development projects. Goddard's IR AD program supports eight Lines of Business: Astrophysics; Communications an d Navigation; Cross-Cutting Technology and Capabilities; Earth Science; Helioph ysics; Planetary Science; Science Small Satellites Technology; and Suborbital Pl atforms and Range Services. Task progress is evaluated twice a year at the Mid-term IRAD review and the end of the year. When the funding period has ended, the PIs compete again for IRAD funding or seek new sources of development an d research funding or agree to external partnerships and collaborations. In som e cases, when the development work has reached the appropriate Technology R eadiness Level (TRL) level, the product is integrated into an actual NASA missio n or used to support other government agencies. The technology may also be lic ensed out to the industry. The completion of a project does not necessarily indic ate that the development work has stopped. The work could potentially continu e in the future as a follow-on IRAD; or used in collaboration or partnership with Academia, Industry and other Government Agencies. If you are interested in par tnering with NASA, see the TechPort Partnerships documentation available on th e TechPort Help tab. http://techport.nasa.gov/help

Images



SmallSat Common Electronics Board
Electronics Board
(https://techport.nasa.gov/image/36614)

Technology Areas

Primary:

- TX02 Flight Computing and Avionics
  - TX02.X Other Flight Computing and Avionics

Target Destinations

Earth, Others Inside the Solar System

SmallSat Common Electronics Board (SCEB)

Completed Technology Project (2014 - 2018)

Links

NTR 1432651073
(no url provided)

Project Website:

http://aetd.gsfc.nasa.gov